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ABSTRACT

Futures research can help human beings have a better knowledge of things to come, determine needs, and set priorities for achieving goals. This paper surveys futures research methods, concentrating on the Delphi method of forecasting goals. The case study used to illustrate the Delphi method is a comparison of hierarchical, homogeneous, and heterogeneous panels of experts in specialist and generalist sections who determined priorities for a program in family studies. A questionnaire, evaluated by a 15-member advisory committee, was completed by 104 persons in six Delphi panels. The response to the three-round study was 89.4 percent, 82.7 percent, and 89.4 percent. The Delphi method was found suitable to develop objectives, course groupings, and content topics for a program in family studies. There were sufficient differences in the panels to warrant continued research into the characteristics of groups used to determine policy. (Author/JM)

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Determination of Educational Policy

by Futures Research Methods

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Policy by Futures Methods

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Determination of Educational Policy

by Futures Research Methods

Futures researchers are concerned with alternative actions. Change is accepted. If projected scenarios are disliked, action may be taken to prevent the situation. If projections are positive, people will work to attain the desired situation.

Hencley and Yates (1974) reviewed methodologies used to forecast change in education. The approaches were: exploratory, to warn of problems; normative, to seek goals, costs, and so to plan; and modeling, to note the impact. If situations were complex, morphological analysis, a system exploring multiple solutions and assessment occurred. Techniques used in forecasting included trend extrapolation based on projection of past events; the Delphi method, in which opinion about the future and goals was refined through feedback; scenario forecasting, in which the future was described in story form; matrix forecasting, in which alternative solutions were compared; relevance tree or contextual mapping, in which different pathways for reaching goals were explored; simulations, in which the computer analyzed the process of change; and Monte Carlo, Bayesian, and Markov Chain analysis, statistical methods of forecasting.

This study used the Delphi method. Originally the Delphi method was used to forecast future events dependent upon technology. More recently, the method has been used in

business to determine the cost-benefits of projects and to assist in making decisions. In health sciences the method was used to identify the pattern of patient days and income. In education, the Delphi method has been used to determine goals and objectives, competencies, and to evaluate projects, publications, and processes. In social sciences the Delphi method has been used to determine alternatives and to involve more persons in policy making.

Olaf Helmer (1966), a major researcher in Delphi methodology used the opinion of international experts to predict changes needed for the survival of man, permitting the experts to revise their predictions in three iterations. To Helmer, Delphi purposes were philosophic as they increased man's understanding of issues and technology; pragmatic, in that future needs were determined; and methodological, providing new ways to make decisions. The traditional Delphi method of forecasting used by Helmer included these steps:

1. Select a panel of experts.
2. Question the experts independently.
3. Feed information about the responses back to the experts.
4. Invite the experts to revise the prediction or to give reasons for not revising.
5. Repeat until consensus is achieved.(four rounds)
6. Analyze each round using the median and interquartile range.

Most educational researchers have modified the traditional method. The Skyline Wide Educational Planning Project in Dallas (1974) utilized large panels with representation from all levels of society. The Delphi method was used as a learning activity by Weaver (1971). My pilot study was to have an undergraduate class suggest ways in which family planning concepts could be incorporated into an international professional meeting to attract young graduates. A review of family planning concepts was achieved . O'Connell (1975) submitted a self-explanatory manual to a Delphi panel for evaluation. Rosich (1975) had administrators analyze cost-benefits in education using tools from the National Center for Higher Education Management Systems.

Regarding panel structure, Helmer (1966) identified the specialist as one who provided substantive information, free from misinterpretation if a model were provided. The generalist lacked this knowledge, but was able to formulate problems, to structure models, and to give preference evaluations. Lillyquist (1975) found females performed better in face to face discussion and males were better in the Delphi method. Burks (1974) found non-professionals achieved majority consensus earlier and were less conservative, predicting more change than did professionals.

Holt (1974) recommended including potential users in planning a Delphi. Davis (1975) supported this in an experiment that included citizens to determine land use.

To date, I have used the Delphi method as a teaching device, as mentioned above, and in determining educational goals in a study to assist in the implementation of a program in family studies at the College of Home Economics, University of Saskatchewan, by identifying objectives, course groupings, and content topics for formal, non-formal, and informal learning systems in Saskatchewan, and to contribute to Delphi theory by comparing experts that were specialists and generalists in hierarchical, homogeneous, and heterogeneous sections. A 15 member advisory committee of educators, curriculum specialists, and futures researchers evaluated the objectives and pilot-tested the questionnaire completed by 104 persons in two groups; specialists (home economists) and generalists (other university graduates trained professionally to work with families), each with three sections: hierarchical (in the formal educational system) homogeneous (in the home), and heterogeneous (in the community in consulting and programming roles). The response was 89.4%, 82.7%, and 89.4% in three rounds. The interval between rounds was 24 and 26 days. A four point Likert-type

scale was used as a metric.

The data derived from the third round Delphi questionnaire were submitted to factor analysis with varimax rotation. A model for objectives was derived, which had three major components entitled; human development, communication, and integrative processes.

There were significant differences when the variable was panel structure, for some of the topics. Main effects due to groups show differences between specialists and and generalists. From the 99 items, 13 showed this type of main effect. Main effects due to sections were between the heterogeneous and other sections except in the non-formal system for the item family planning, where the difference was due to the homogeneous sections. Main effects due to sections occurred in nine items. If no significant differences appeared, determination of policy by the public was appropriate. This held for the topics care of children, censorship, conflict resolution, coping, family goals and objectives, family life cycle, hobbies, living with stress, maturation, parent education, teaching children about sex, marriage preparation, sexism, understanding emotions, use of television and radio in the home, and world citizenship. Because there were some differences, more research should be conducted into the determination of policy by the public.

The final table lists all items considered. It is arranged to show in which system each topic was considered most important, ranked according to the highest mean. In the population of this study the informal learning system(the home) was the preferred place to teach 26 of the 33 items. The formal learning system (the school) was preferred for four topics: communication skills, family life cycle, gerontology, and family breakdown. The non-formal learning system (consultants) was preferred for three and tied for first with the informal system for parent education.

In summary, the Delphi method was suitable for the development of objectives for a program in family studies at the college level. Such a program would provide a graduate with an understanding of human development, communication, and integrative processes to help individuals and families improve the management of food, shelter, textiles, and human relationships. Further research is needed into the selection of panels to determine public policy.

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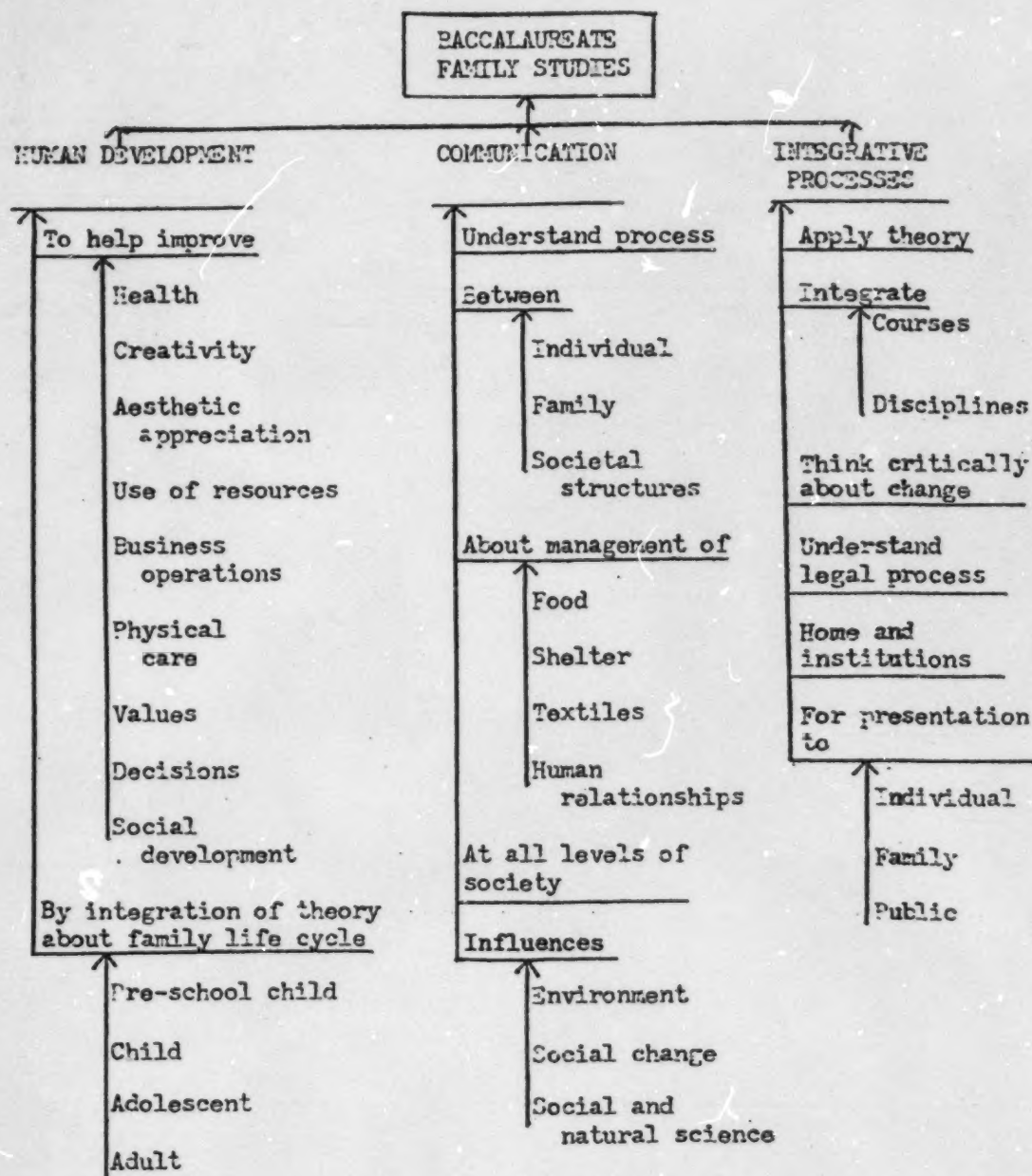


Figure 1 A Model of Objectives for a Program of Family Studies in a College of Home Economics

TABLE 1 .--Priority Ranking of Content Topics in Formal, Non-Formal, and Informal Systems

Description	Formal	Non-formal	Informal
Care of Children	2	3	1
Censorship	3	2	1
Civil Rights	3	1	2
Communication Skills	1	3	2
Conflict Resolution	2	3	1
Contemporary Society	2	1	3
Coping	3	2	1
Death and Dying	3	2	1
Decision Making	3	2	1
Family Goals & Objectives	2	3	1
Family Life Cycle	1	3	2
Family Planning	2	3	1
Gerontology	1	3	2
Growth & Self Awareness	2	3	1
Hobbies	3	2	1
Homemaking	3	2	1
Interpersonal Relationships	2	3	1
Living with Stress	2	3	1
Maturation	2	3	1
Middle Age	3	2	1
Parent Education	3	1	1
Sexuality	2	3	1
Teaching Children about Sex	2	3	1
Values	2	3	1
*Civic Responsibilities	3	2	1
*Community Support Groups	3	1	2
*Family Breakdown	1	3	2
*Marriage Preparation	2	3	1
*Sexism	2	3	1
*Sexual Therapy	3	2	1
*Understanding Emotions	3	2	1
*Use of Television & Radio			
In Home	3	3	1
*World Citizenship	3	2	1

*Additional items supplied by panelists

Appendix A

Outline and Transparency Masters

for Presentation

OUTLINE

Purpose:

Concerns: 1 increasing population and demands to participate
in policy making process
how?

2 role of home economist in family life education
Committee on Family Life Education, Saskatchewan
Role study of College of Home Economics

Futurists

Alternatives

negative scenario--prevent
positive scenario--achieve

Methods-- Hencley and Yates

Delphi Method

definition-- opinion about the future and about goals
refined through feedback to achieve consensus

uses-- forecast future events

business-- cost-benefit, decisions

health sciences-- patients, income, expenditure

education-- determine goals and competencies

evaluate projects, publications, processes
teaching strategy

social sciences-- determine alternatives, policy

method-- Helmer traditional

select panel

specialist-- one who provides substantive
information, free from misinterpretation
model provided

generalist-- formulate problems

structure models

give preference evaluations

in education-- the trustee

my study-- specialist-- home economists

generalist-- other persons who

work with families

hierarchy-- formal learning system--school

homogeneous-- informal learning system--home

heterogeneous-- non-formal learning system

community consultants

e.g. scouts,

Findings

Model of objectives --preparation of teachers of family
life education

Effect of panel structure-- no significant differences,
determine policy by public

list

13/99 showed differences-- more research needed
Which learning system for content:

informal-- home-- 26/ 33

sexuality, teaching child about sex, sexism,
sexual therapy, values plus others

formal- school-- 4

communication skills, family life cycle,
gerontology, family breakdown

non-formal-- 3 +1 tied

Summary

--Delphi method suitable for objectives

-- program-- human development, communication, integrative
food, shelter, textiles, human relationships

-- further research into selection of panels to determine
policy

Prediction

-- role of trustees

more concerned with process of education

changing environment-- more in the home-- television
personnel, media rather than classroom

FORECASTING METHODOLOGIES

APPROACHES:

EXPLORATORY

NORMATIVE

MODELLING

MORPHOLOGICAL

ASSESSMENT

TECHNIQUES:

TREND EXTRAPOLATION

DELPHI METHOD

SCENARIO

CROSS IMPACT MATRIX

RELEVANCE TREE

CONTEXTUAL MAPPING

SIMULATION

MONTE CARLO ANALYSIS

BAYESIAN ANALYSIS

MARKOV CHAIN ANALYSIS

TRADITIONAL DELPHI PROCESS

- 1) SELECT EXPERT PANEL
- 2) QUESTION EXPERTS INDEPENDENTLY
- 3) FEEDBACK
- 4) REVISE OR GIVE REASONS
- 5) REPEAT TO CONSENSUS (4 ROUNDS)
- 6) ANALYSIS: MEDIAN
INTERQUARTILE RANGE